

AMENDMENTS TO THE CLAIMS

The following is a complete listing of revised claims with a status identifier in parenthesis.

LISTING OF CLAIMS

1. (Previously Presented) An apparatus for controlling a boosted voltage, comprising:

a voltage generating circuit configured to generate a boosted voltage from an input voltage based on a control current and charges stored in a charge storing element and configured to receive the control current while the charges stored in the charge storing element are used to generate the boosted voltage, the voltage generating circuit including,

a clock signal generator,

a level shifter circuit selectively changing a level of the input voltage based on a clock signal output from the clock signal generator, and

a switching structure configured to selectively store the charges in the charge storing element and selectively output the stored charges in conjunction with charges corresponding to the control current as the boosted voltage based on output from the clock signal generator and the level shifter circuit; and

a control circuit configured to generate the control current based on the boosted voltage.

2. (Previously Presented) The apparatus of claim 1, wherein the voltage generating circuit comprises:

a capacitor; and wherein

the switching structure is configured to selectively store charges corresponding to the input voltage in the capacitor, and to selectively output the stored charges in conjunction with charges corresponding to the control current as the boosted voltage.

3. (Original) The apparatus of claim 2, wherein the control circuit is configured to generate the control current based on a difference between the boosted voltage and a desired boosted voltage.

4. (Previously Presented) The apparatus of claim 1, wherein the switching structure includes first, second, third and fourth switches; and the voltage generating circuit further comprises:

a capacitor configured to store charges corresponding to the input voltage while the second and third switches are turned on, and outputting the boosted voltage while the first and fourth switches are turned on.

5. (Previously Presented) The apparatus of claim 4, wherein the clock signal generator is configured to generate first, second and third clock; and

the level shifter circuit is configured to selectively change the level of the input voltage in response to the third clock signal to output a switching control signal; and wherein

the first and second switches are switched in response to first and second clock signals; and

the third and fourth switches are switched in response to the switching control signal.

6. (Original) The apparatus of claim 5, wherein the third clock signal has an inverted phase with respect to the first clock signal;

a front edge of the second clock signal is delayed by a fixed time with respect to a front edge of the first clock signal; and

an active period of the second clock signal is narrower than that of the first clock signal.

7. (Original) The apparatus of claim 5, wherein the level shifter includes a metal-oxide silicon (MOS) capacitor.

8. (Original) The apparatus of claim 5, wherein the switch control signal swings between the level of the input voltage and substantially double the level of the input voltage.

9. (Original) The apparatus of claim 8, wherein the fourth switch is turned on during a non-active status of the switching control signal, and the third switch is turned on during an active status of the switching control signal.

10. (Original) The apparatus of claim 1, wherein the control circuit is configured to generate the control current based on the boosted voltage and a desired boosted voltage.

11. (Original) The apparatus of claim 1, wherein the control circuit is configured to generate the control current based on a difference between the boosted voltage and the desired boosted voltage.

12. (Original) The apparatus of claim 1, wherein the control circuit comprises:

a voltage divider configured to generate a divided voltage from the boosted voltage;

a comparator configured to compare the divided voltage with a reference voltage; and

a current generator configured to generate the control current based on output from the comparator.

13. (Original) The apparatus of claim 12, wherein the reference voltage

represents a desired boosted voltage.

14. (Original) The apparatus of claim 1, wherein the control circuit comprises:

a voltage divider configured to divide the boosted voltage to generate a divided voltage;

an amplifier configured to amplify a difference voltage between a reference voltage and the divided voltage; and

a voltage controlled current source configured to generate the control current based on the amplified difference voltage.

15. (Original) The apparatus of claim 14, wherein the reference voltage represents a desired boosted voltage.

16. (Original) The apparatus of claim 14, wherein voltage controlled current source decreases the control current when the divided voltage is higher than the reference voltage, and increases the control current when the divided voltage is lower than the reference voltage.

17. (Previously Presented) A method for controlling a boosted voltage, comprising:

generating a boosted voltage from an input voltage based on a control current and charges stored in a charge storing element, the generating of a boosted voltage including,

generating output from a clock signal generator;

selectively changing a level of the input voltage based on output from the clock signal generator,

selectively storing the charges in the charge storing element and selectively outputting the stored charges in conjunction with charges corresponding to a control current as the boosted voltage based on output from the clock signal generator and the selectively changed level of the input voltage;

generating the control current based on the boosted voltage; and

supplying the control current for generating the boosted voltage while the charges stored in the charge storing element are used to generate the boosted voltage.

18. (Canceled)

19. (Previously Presented) The method of claim 17, wherein the generating the control current step generates the control current based on a difference between the boosted voltage and a desired boosted voltage.

20. (Original) The method of claim 17, wherein the generating the

control current step generates the control current based on the boosted voltage and a desired boosted voltage.

21. (Original) The method of claim 20, wherein the generating the control current step generates the control current based on a difference between the boosted voltage and the desired boosted voltage.

22. (Original) The method of claim 17, wherein the generating the control current step comprises:

generating a divided voltage from the boosted voltage by dividing the boosted voltage;

a comparing the divided voltage with a reference voltage; and

generating the control current based on output from the comparing step.

23. (Original) The method of claim 22, wherein the reference voltage represents a desired boosted voltage.

24. (Original) The method of claim 17, wherein the generating the control current step comprises:

dividing the boosted voltage to generate a divided voltage;

amplifying a difference voltage between a reference voltage and the divided voltage; and

generating the control current based on the amplified difference voltage.

25. (Original) The method of claim 24, wherein the reference voltage represents a desired boosted voltage.

26. (Previously Presented) The apparatus of claim 2, wherein the switching structure is configured to selectively receive the control current while configured to selectively output the stored charges.

27. (Previously Presented) The apparatus of claim 26, wherein the switching structure includes a switch configured to selectively connect a portion of the control circuit generating the control current with the capacitor.

28. (Previously Presented) The apparatus of claim 2, wherein the voltage generating circuit is configured to not receive the control current when charges are stored in the capacitor.

29. (Previously Presented) The apparatus of claim 4, wherein the first switch is configured to connect a portion of the control circuit generating the control current with the capacitor when turned on.

30. (Previously Presented) The apparatus of claim 5, wherein the first switch is configured to connect a portion of the control circuit generating the control current with the capacitor when turned on.

31. (Previously Presented) The apparatus of claim 30, wherein the third clock signal has an inverted phase with respect to the first clock signal;

a front edge of the second clock signal is delayed by a fixed time with respect to a front edge of the first clock signal; and

an active period of the second clock signal ends before that of the first clock signal.

32. (Previously Presented) An apparatus for controlling a boosted voltage, comprising:

a voltage generating circuit configured to generate a boosted voltage from an input voltage based on a control current and charges stored in a charge storing element, the voltage generating circuit including,

a clock signal generator,

a level shifter circuit selectively changing a level of the input voltage based on a clock signal output from the clock signal generator, and

a switching structure configured to selectively store the charges in the charge storing element and selectively output the stored charges in

conjunction with charges corresponding to the control current based on output from the clock signal generator and the level shifter circuit; and a control circuit configured to generate the control current based on the boosted voltage, and configured to supply the control current to the voltage generating circuit while the charges stored in the charge storing element are used to generate the boosted voltage.

33. (Previously Presented) An apparatus for controlling a boosted voltage, comprising:

a voltage generating circuit configured to generate a boosted voltage from an input voltage based on a control current and charges stored in a charge storing element, and configured to receive the control current while the charges stored in the charge storing element are used to generate the boosted voltage; and

a control circuit configured to generate the control current based on the boosted voltage; wherein

the voltage generating circuit further includes,

a clock signal generator configured to generate first, second and third clock signals,

a level shifter circuit configured to selectively change a level of the input voltage in response to the third clock signal to output a switching control signal, and wherein

first and second switches are switched in response to first and second clock signals, and

third and fourth switches are switched in response to a switch control signal.